

Docket: NECN 18.304 (100933-16778)
Application: Serial No. 09/775,927

AMENDMENTS TO THE DRAWINGS

A minor amendment to FIG. 3 has been made via the current amendment. Specifically, reference numeral 201 (corresponding to modulation block 200) has been corrected to 200 to be consistent with the specification. Also, reference numeral 301 has been deleted as it is not referenced in the specification.

A minor amendment to FIG. 5 has been made via the current amendment. Specifically, reference numeral 301 has been deleted as it is not referenced in the specification.

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REMARKS

This is in response to the Office Action mailed July 10, 2006. Applicant is appreciative for the recognized allowable subject matter.

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FIG. 3 has been amended to correct a minor inconsistency without adding new matter. Specifically, reference numeral 201 has been corrected to 200 (which now correctly corresponds to the modulation block).

Paragraph 9 of the specification has been amended to correct an inconsistency. Specifically, FIG. 3 (labeled prior art) as-filed shows the output of band pass filter 330 fed into frequency multiplier 250, and frequency multiplier 250, in turn, feeding its output to frequency divider 240. However, the specification was ambiguous with respect to this flow as it stated that the frequency divider was "a third 1/2-frequency-divider 240 for dividing and phase-shifting the output from the BPF 330 to output a pair of orthogonal carrier waves having a phase difference of 90 degrees therebetween". To correct this ambiguity, Applicants have amended the specification to more clearly state the flow as follows: "a frequency-multiplier (doubler) 250 for doubling the output of the BPF 330, a third 1/2-frequency-divider 240 for dividing and phase-shifting the output from the frequency multiplier 250 to output a pair of orthogonal carrier waves having a phase difference of 90 degrees therebetween". Applicants wish to re-emphasize that no new matter was entered via the current amendment as figure 3 as-filed illustrates such a flow with arrows.

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Claim 1 has been amended to clarify the features of the carrier signal, and new claim 17 has been added to illustrate the structure of the quadrature modulation block. No new matter has been added by the amendment and new claim, which find support throughout the specification and figures. In particular, the amendment is supported by figures 7 and 10, which clearly show that any of the frequencies generated in the frequency conversion block 30, 30a is different from the frequency of the carrier signal (for example, $f_{out}=3/4(f_{osc})$ in figure 7, and $f_{out}=5/4(f_{osc})$ in figure 10). It is respectfully submitted that the amendments place the claim in condition for allowance, simplify issues for appeal, and/or do not necessitate additional search and/or consideration. Therefore, it is respectfully requested that the amendments be entered. Additionally, Applicants submit herewith a Request for Continued Examination to ensure that the amendments are entered.

This response/amendment should obviate outstanding issues and make the remaining claims allowable. Reconsideration of this application is respectfully requested in view of this response/amendment.

STATUS OF CLAIMS

Claims 1-7 and 9-17 are pending after this amendment adds new claim 17.

Claim 8 is cancelled.

Claims 5-7, 9, 11, and 12 are allowed.

Claims 1-3 and 13-16 are rejected under 35 U.S.C. § 102(a) as being anticipated by applicant's allegedly admitted prior art. Claim 10 is discussed in the section of the rejection relating to the 35 U.S.C. § 102(a) rejection, and is compared to figure 3 of the present

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application. Therefore, claim 10 is addressed in the context of this rejection. Clarification of the rejection of claim 10 is respectfully requested in the next Office communication.

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art in view of U.S. 6,011,962 (Lindenmeier).

OVERVIEW OF CLAIMED INVENTION

In a non-limiting example, a quadrature modulator comprises: a local oscillator for oscillating at an oscillation frequency; a frequency conversion block for converting said oscillation frequency to output a converted oscillation frequency; and a quadrature modulation block comprising a frequency divider, a first and second multiplier, and an adder, said frequency divider receiving said converted oscillation frequency and dividing said converted oscillation frequency by a factor of two to output a pair of orthogonal signals having therebetween a phase difference of 90 degrees, said first and second multipliers modulating said pair of orthogonal signals with said baseband signal to output a pair of modulated signals, and said adder adding said modulated signals together to output a carrier signal, wherein said carrier signal has a frequency different from said converted oscillation frequency and any of signal frequencies generated within said frequency conversion block.

In another non-limiting example, a method comprises the steps of: generating an oscillation frequency; converting said oscillation frequency to output a converted oscillation frequency; dividing said converted oscillation frequency by a factor of two to output a pair of orthogonal signals having therebetween a phase difference of 90 degrees; modulating said pair of orthogonal signals with a baseband signal to output a pair of modulated signals; and adding said

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modulated signals together to output a carrier signal, wherein said carrier signal has a frequency different from said converted oscillation frequency.

REJECTIONS UNDER 35 U.S.C. §102 and §103

Claims 1-3, 10, and 13-16 are rejected under 35 U.S.C. §102(a) as being anticipated by applicant admitted prior art (AAPA). To be properly rejected under 35 U.S.C. §102(a), the art relied on (i.e., AAPA) must teach each and every feature of the rejected claims. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art in view of U.S. 6,011,962 (Lindenmeier). Applicants respectfully contend, and as will be shown below, neither the AAPA, nor the combination of AAPA and Lindenmeier, teach many of the features of the rejected claims.

The Examiner relies on figure 3 of the application-as-filed as teaching all the features of pending claim 1. Applicants respectfully disagree with this assertion. Specifically, the Examiner is directed to element 250 (corresponding to a frequency multiplier unit) of figure 2, and the corresponding description in paragraph 9 of the application-as-filed. A portion of paragraph 9 from the application-as-filed is reproduced below to aid the Examiner:

"The quadrature modulator of FIG. 3 includes a local oscillator 402 for oscillating at a specified frequency, a first 1/2-frequency-divider 310 for dividing the output frequency of the local oscillator 402 by a factor of two, a second 1/2-frequency-divider 350 cascaded from the first 1/2-frequency-divider 310 for dividing the output frequency thereof by a

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factor of two, a frequency mixer 320 for frequency conversion using the output frequencies of second 1/2-frequency-divider 350 and the local oscillator 402, a band-pass-filter (BPF) 330 for removing the image signal from the output of the frequency mixer 320, a frequency-multiplier (doubler) 250 for doubling the output of the BPF 330, a third 1/2-frequency-divider 240 for dividing and phase-shifting the output from the frequency multiplier 250 to output a pair of orthogonal carrier waves having a phase difference of 90 degrees therebetween, first and second multipliers 210 and 220 for modulating the carrier waves with a baseband signal generated by a digital signal generator 101, and an adder 230 for adding the outputs of the first and second multipliers 210 and 220 to generate an output digital carrier signal.” (Emphasis Added)

It should be noted from the above description that frequency multiplier 250, of Applicant Admitted Prior Art, receives and doubles the input of BPF 30 and passes this doubled output to frequency divider 240. Frequency divider 240 receives the output of frequency multiplier 250 and divides and phase-shifts this output to output a pair of orthogonal carrier waves having a phase difference of 90 degrees therebetween.

By stark contrast, Applicants’ independent claim 1 makes NO mention of a frequency multiplier in the modulation block, but, specifically recites “a frequency conversion block for converting said oscillation frequency to output a converted oscillation frequency” in which “said carrier signal has a frequency different from said converted oscillation frequency and any of

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signal frequencies generated within said frequency conversion block.” In the invention according to claim 1, the frequency of the carrier signal is different not only from the output of BPF 33, but is also different from the output frequency of frequency divider 31 and frequency mixer. Therefore, assuming *arguendo* that the Examiner were to interpret the AAPA to include the frequency multiplier 250 in the frequency conversion block, which is respectfully not conceded, then the output of the frequency multiplexer 250 would constitute the converted oscillation frequency. In this situation the frequency divider receives the converted oscillation frequency, and therefore the carrier signal does not have a frequency different from said converted oscillation frequency. Therefore, the AAPA does not disclose this feature of claim 1.

Similarly, Applicants’ independent claim 13 specifically recites the feature of “dividing said converted oscillation frequency by a factor of two to output a pair of orthogonal signals having therebetween a phase difference of 90 degrees”. However, as mentioned above, Applicants’ admitted prior art merely show “a third 1/2-frequency-divider 240 for dividing and phase-shifting the output from the frequency multiplier 250 to output a pair of orthogonal carrier waves having a phase difference of 90 degrees therebetween”. Again, Applicants’ admitted prior art of figure 3 does NOT show frequency divider 240 receiving the output of BPF 301, but shows that the frequency divider 240 receives the output of frequency multiplier 250.

Further, the secondary reference relied upon by the Examiner (i.e., Lindenmeier) also fails to teach such features, as per the teachings of claims 1 and 13.

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If the Examiner still feels that figure 3 (Applicants' admitted prior art) discloses a frequency divider receiving the converted oscillation frequency from a frequency conversion block (as per Applicants' claim 1), or if the Examiner still feels that figure 3 (Applicants' admitted prior art) teaches the step of dividing the converted oscillation frequency (as per claim 13), Applicants respectfully remind the examiner that it is the duty of the examiner to specifically point out each and every limitation of a claim being rejected as per §1.104(c)(2) of Title 37 of the Code of Federal Regulations and section 707 of the M.P.E.P., which explicitly states that "the particular part relied on must be designated" and "the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified".

Hence, Applicants respectfully assert that Applicants' Admitted Prior Art CANNOT teach or suggest the features of independent claims 1 and 13. Applicants, therefore, respectfully request the Examiner to withdraw the rejection with respect with to claim 1, and hereby request allowance thereof. The above-mentioned arguments substantially apply to dependent claims 2-4, 10, and 14-16 as they inherit all the features of the claim 1. Allowance is respectfully requested of dependent claims 2-4, 10, and 14-16 as they depend from an allowable claim.

New claim 17 recites a "frequency divider receiving said converted oscillation frequency". Applicants respectfully assert that Applicants' admitted prior art of figure 3 does NOT show frequency divider 240 receiving the output of BPF 301, but shows that the frequency divider 240 receives the output of frequency multiplier 250. Therefore for at least this reason, new claim 17 is allowable.

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SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of applicants' presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

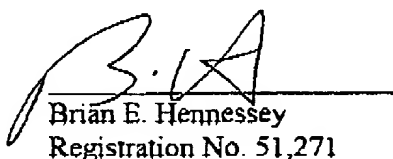
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As this response/amendment has been timely filed, no request for extension of time or associated fee is required. However, the Commissioner is hereby authorized to charge any deficiencies in the fees provided to Deposit Account No. 50-1290.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact applicant's representative at the below number.

Respectfully submitted,


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